Conclusions

The results show that periosteum and chondrocytes placed onto a biodegradable polymer will form into a composite tissue of bone and cartilage. Moreoever, bone and cartilage composite formation with selective placement of periosteum and chondrocytes on a biodegradable polymer scaffold was shown.

EXAMPLE 6

Implantation of Matrix for Ingrowth of Fibrous Tissue to Increase Mechanical Properties and Cell Survival

The following study was conducted to increase the mechanical strength and pliability of the heart valve leaflets or other engineered tissues such as those for use as blood vessels.

Methods

A PGA mesh as described in Example 1 or 2 was implanted subcutaneously in an animal, then removed after a period of one to two weeks. Fibroblasts migrated into the polymeric mesh while it was implanted. The implant was then seeded with other cells such as chondrocytes or endothelial cells and cultured in vitro for an additional period of time.

Results

The resulting implant was shown to have greater mechanical strength and pliability than implants formed solely by seeding of dissociated cells.

Modifications and variations of the method and compositions described herein will be obvious to those skilled in the art from the foregoing detailed description. Such modifications and variations are intended to come within the scope of the appended claims.

We claim:

1. A method for making a cell-matrix construct for use as a heart valve or blood vessel comprising

implanting into an animal at a first site a fibrous matrix formed of a synthetic biodegradable polymer having seeded therein a mixture of cells selected from the group selected from endothelial cells, myofibroblasts, skeletal muscle cells, vascular smooth muscle cells, myocytes, fibromyoblasts, and ectodermal cells, wherein the matrix is formed of a biocompatible, biodegradable polymer, and

implanting into an animal or human the matrix at a site where the resulting cell-construct is needed.

2. The method of claim 1 further comprising seeding the matrix with dissociated parenchymal or connective tissue cells.

3. The method of claim 1 wherein the matrix is first cultured at a first site in a patient prior to being implanted at a second site.

4. The method of claim 1 wherein the matrix is a heart valve and is implanted in the heart.

5. The method of claim 1 wherein the cell-matrix construct is seeded with vascular smooth muscle cells and endothelial cells is implanted to form a valve.

6. The method of claim 5 wherein the valve is a heart valve.

7. The method of claim 1 wherein the cell-matrix construct is seeded with endothelial cells and implanted to form a blood vessel.

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